CHP-IDA Overview

Overview of the Crew Health and Performance Integrated Data Architecture

2023 HRP Investigators Workshop

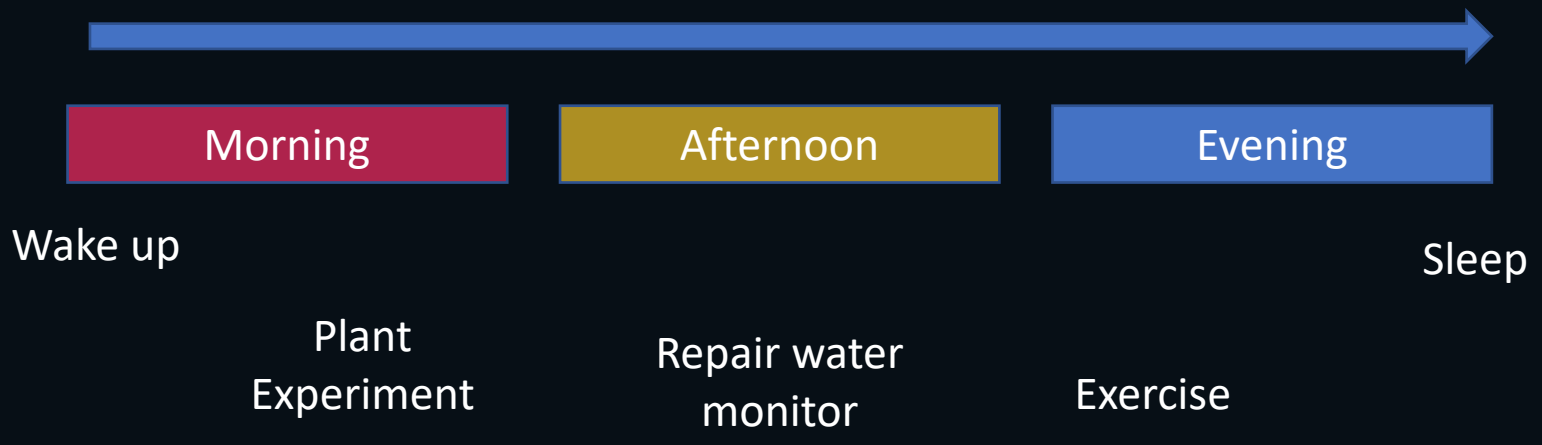
An introduction to CHP-IDA

- Mission Timeline
- Data Categories
- The Approach to CHP-IDA Project
- Next Steps

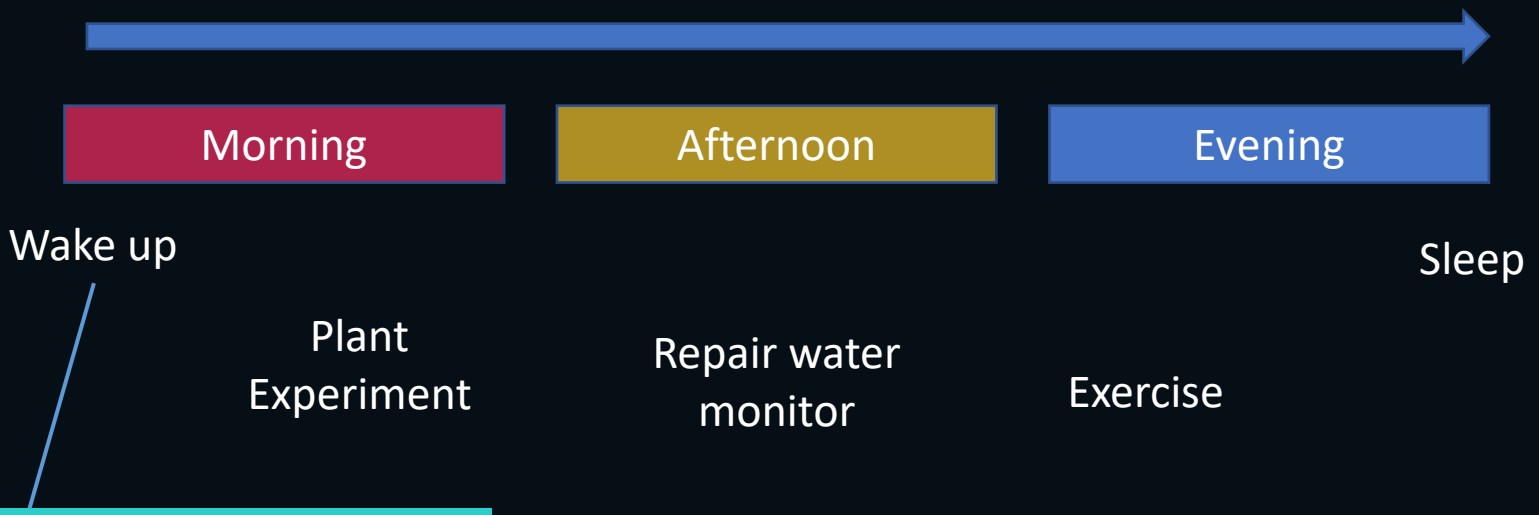
Presentation Summary

An overview of how the CHP-IDA project is integrating data across the Crew Health and Performance (CHP) domain to enable advanced analytical modeling and decision support systems to assist the crews of future Exploration missions.

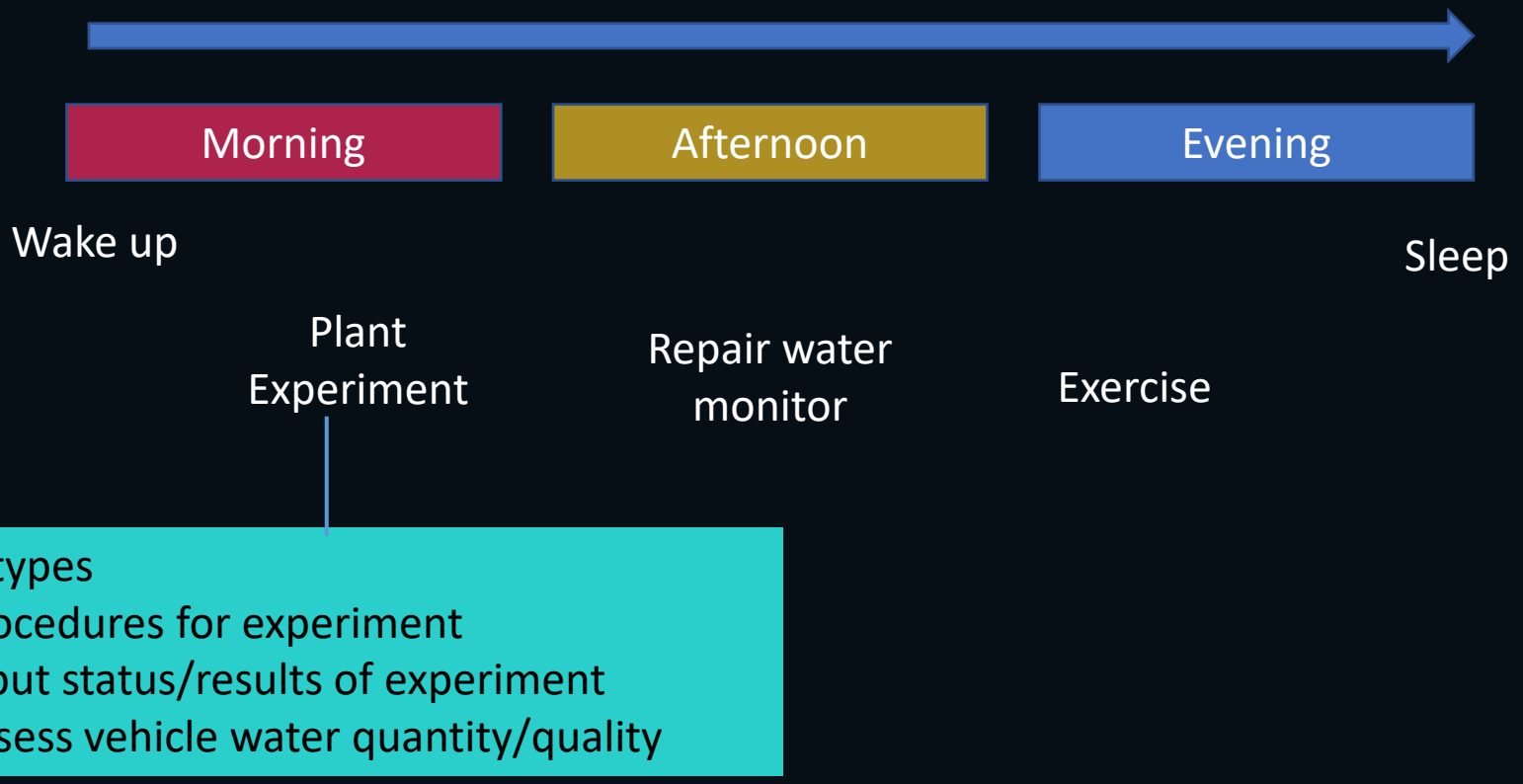
Mission Timeline



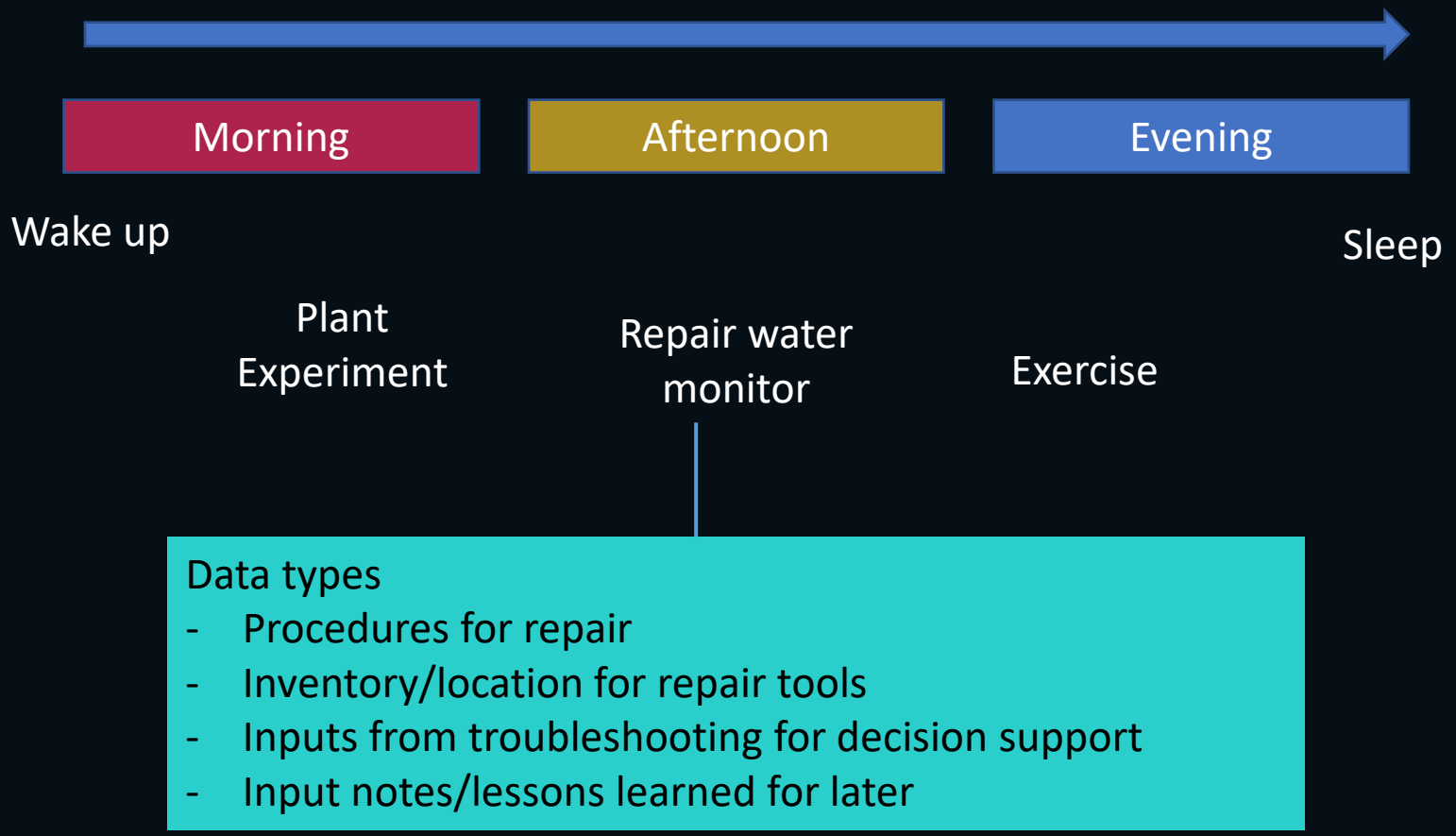
Mission Timeline



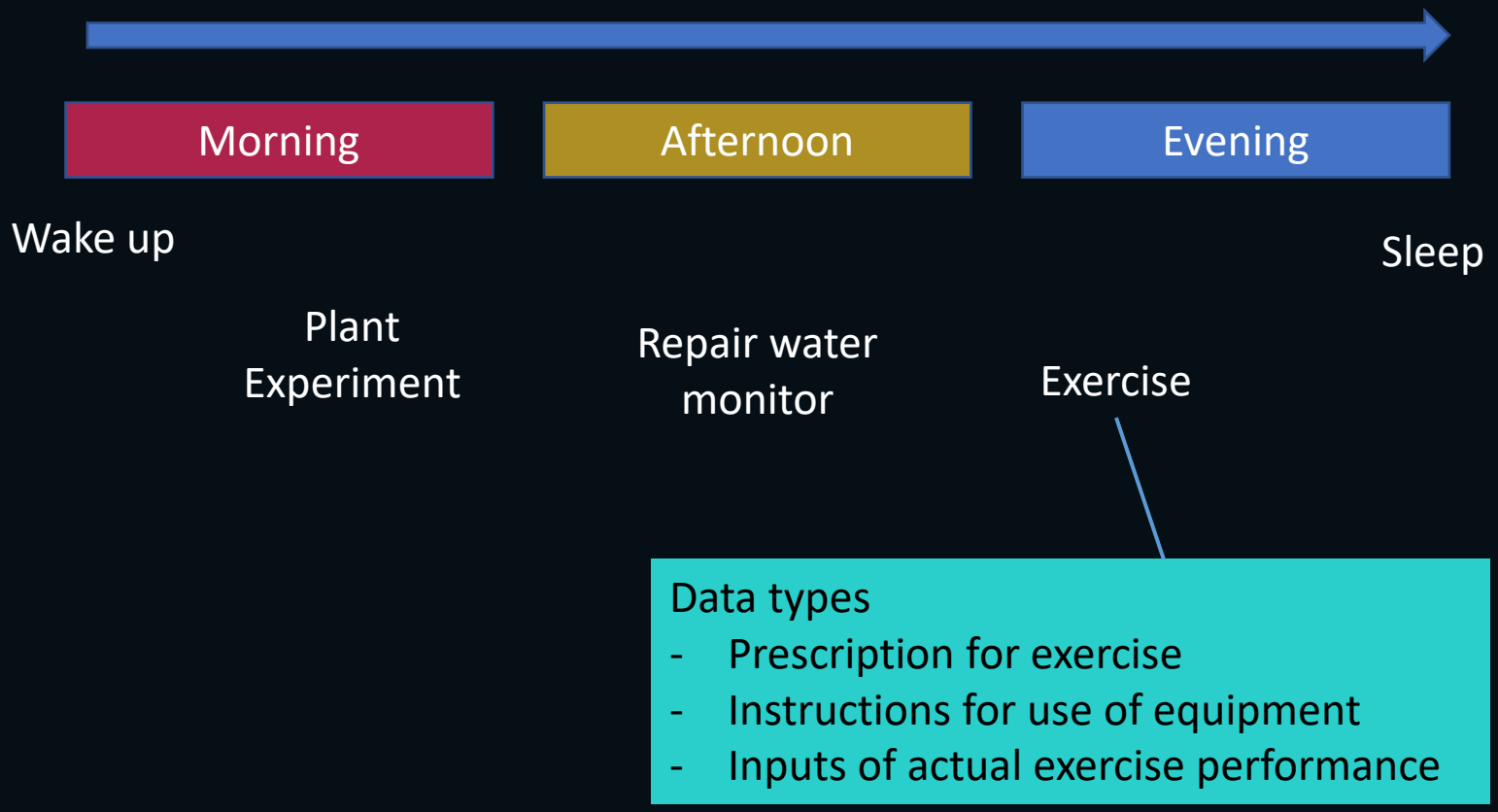
Mission Timeline



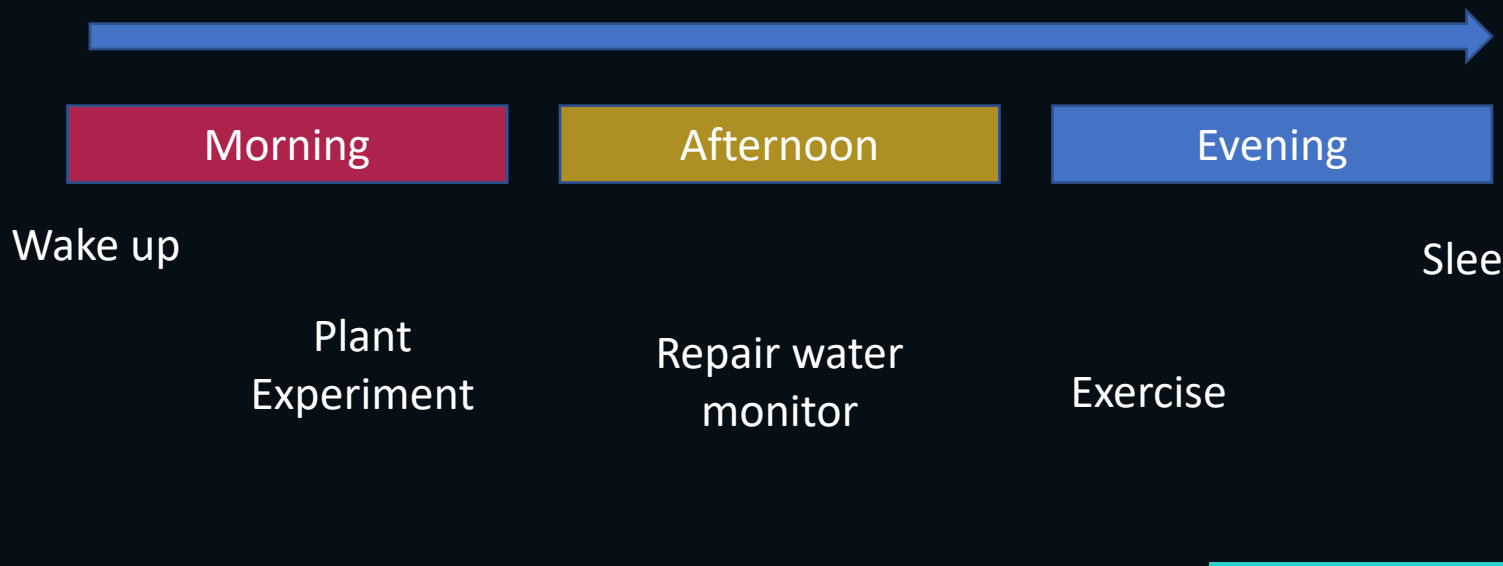
Mission Timeline



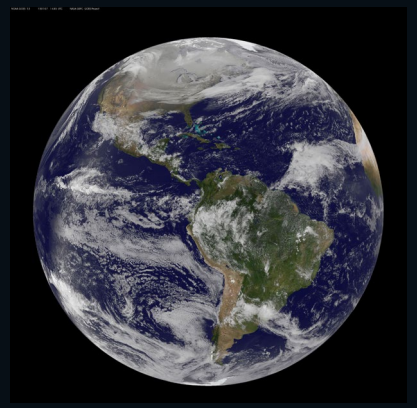
Mission Timeline



Mission Timeline



Data Categories



CHP Domains

Behavioral
Countermeasures
Medical
Environmental
EVA

Interfaces to Domains

Vehicle
Inventory Mgmt
Procedures
Research

CHP-IDA

Decisions

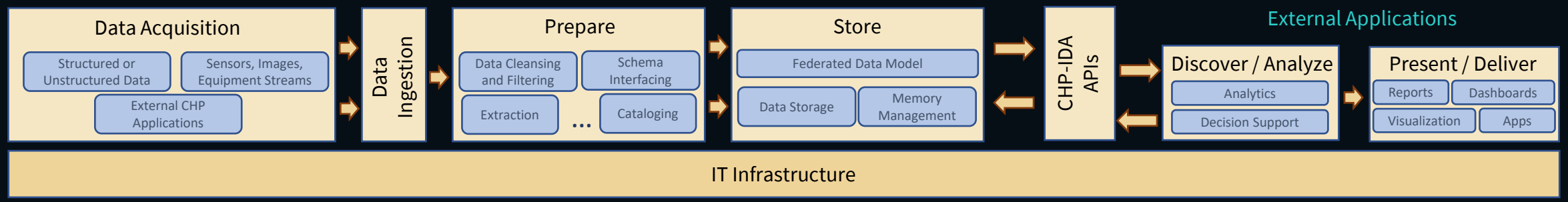
- Crew Health
- Vehicle Health
- “GO” for mission
- “GO” for EVA

Applications | Displays | Descriptive Analytics | Predictive Analytics | Predictive Modeling | Decision Support

All need data at their core in order to operate

But not just any data....

Normalized | Pre-processed | Ready-to-use | Data



Next Steps

- FY23 — CHP-IDA Release 1.1
  - Integrations
    - EVA
    - Exercise Countermeasures
    - Medical
  - Scenario Identification & Development
  - Core CHP-IDA Build Out
  - Initial API Definitions & Implementations
  - Test Bed Design & Build Out – JSC Bldg 15
- FY24 — CHP-IDA Release 1.2
  - Continuous Build Out
  - Decision Package for Flight Program
  - Future Flight Integration

CHP-IDA wants your help

- Scenarios
- Use Cases
- Data Uses
- Alpha and Beta Testers
- API Usability Feedback
- Integrations

Thank You!

Philip Augustine
Project Manager, NASA-JSC
Philip.m.Augustine@nasa.gov

Backup Slides

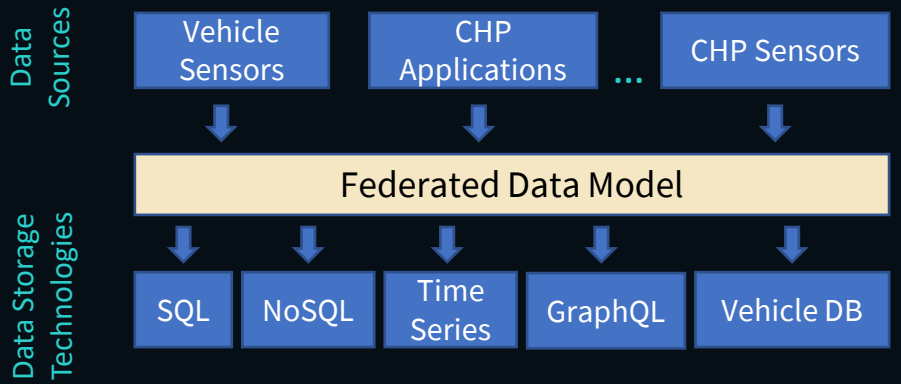
What is CHP-IDA?

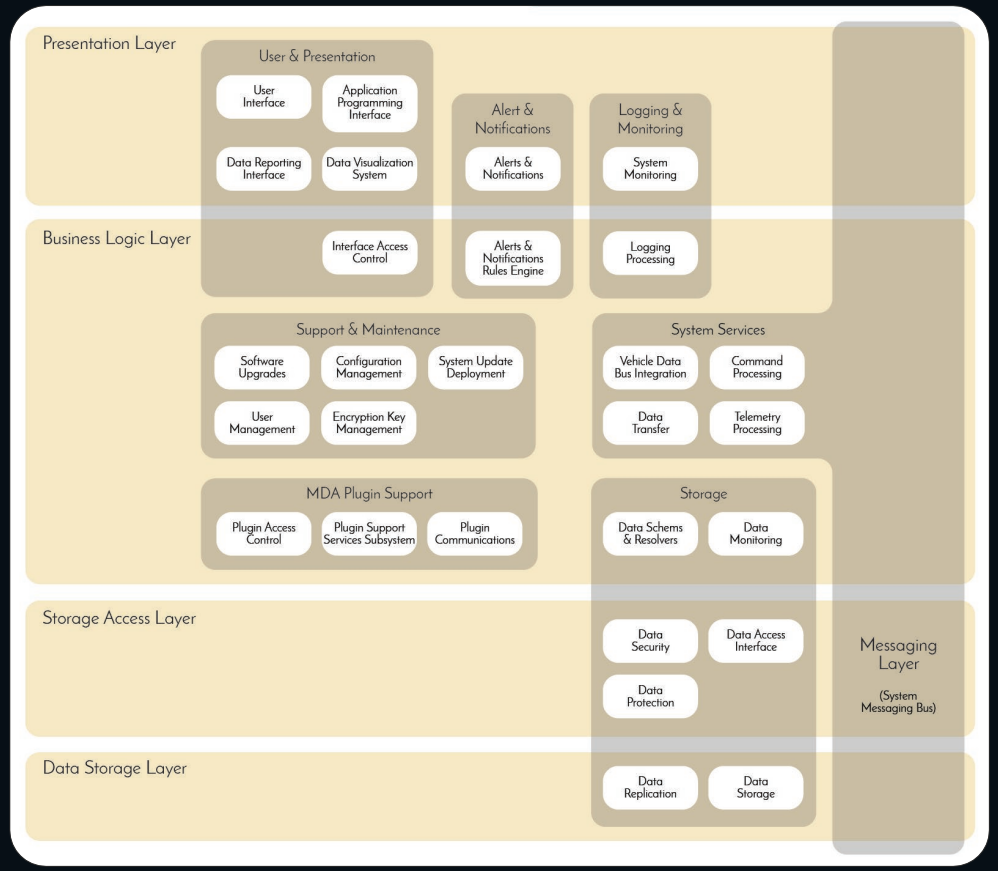
CHP-IDA
Central Thesis

- Crew will need to be more self-sufficient and independent as missions move further from Earth
- Data representing as comprehensive a picture of the crew's work, life onboard, and environment are necessary to sufficiently support them
- CHP-IDA is an enabling technology.

Integrated Data Architecture Overview

- Comprehensive Integration of Crew-Relevant Data
- Federated Data Model
- Application Programming Interfaces (APIs)



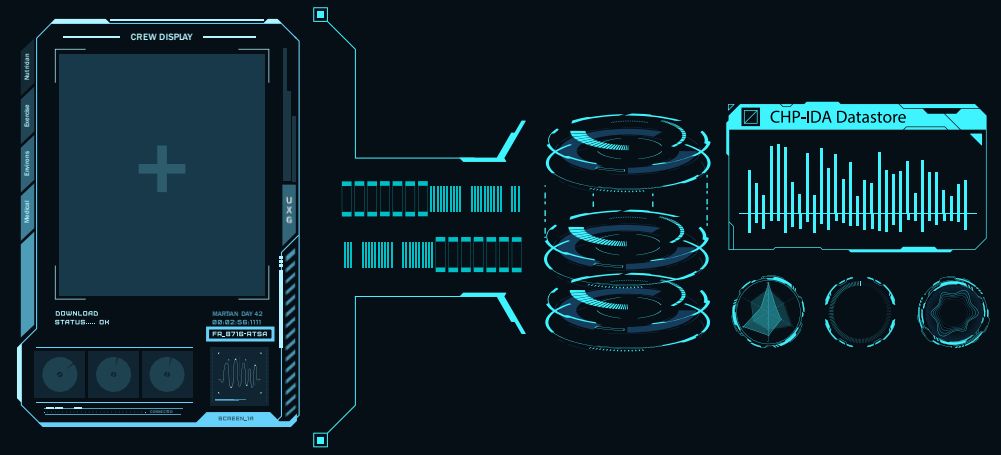


Its all about the DATA…

- Exploration missions – Missions further than lunar distance bring new constraints
- Crews need to be more self-reliant and Earth-independent
- The Crew, their work, their environment, the vehicles, and the systems onboard all generate data… a multitude of data E.g. ECLSS: streaming -- environment data ▶ Exercise: streaming -- equipment sensors ▶ Medical: event – vitals, sensor data sets, …
- Applications are being developed (outside of CHP-IDA) to aid these self-reliant crews

The Approach to CHP-IDA

- CHP-IDA Path-to-Flight Project
- Low initial cost to evaluate the concepts
- Discover and prove out concepts on the ground
- Establish a foundation for a flight mission using CHP-IDA
- Provide IDA technology to the CHP community



Data
Displays and Interfaces

Data
Storage and Processing

Outline of the Approach

Building upon existing work

Devise Data Architecture Crew **Scenarios** and **Procedures**

Study the Impact on Crew Performance on the **Ground**

Validate Findings in Exploration-Analog Env.

Develop CHP-IDA **Requirements**

Transition CHP-IDA to a flight project to build

The Approach to CHP-IDA Project

- Requirement Solicitation through engagement with the CHP community
  - Scenario Development
  - Procedure Analysis
  - Requirement Solicitation
  - Interactive Ideation through rapid prototyping and storyboarding
- Integrated Data Architecture Engineering
- Functional Software Development
- Representative Integrations and Demonstrations
- Systems and Project Engineering
- Test Bed and Demonstration Facility at JSC Building 15